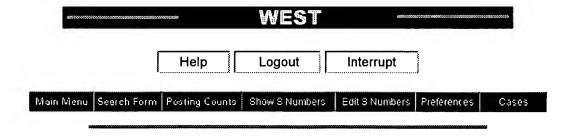
## **WEST Search History**

DATE: Thursday, June 19, 2003

Set Name side by side	Query	Hit Count	Set Name result set
DB = USPT	,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ		
L8	L7 and (boxes or carriers or containers)	18	L8
L7	13 and (angle same nozzle)	20	L7
L6	L5 and angl\$	17	L6
L5	L3 and (spray nozzles)	26	L5
L4	L3 and (angle spray nozzles)	0	L4
L3	L2 and rotor	108	L3
L2	L1 and enclosure	1736	L2
L1	(cleaning system) or (cleaning apparatus)	34690	L1

END OF SEARCH HISTORY



## Search Results -

Term	Documents
BOXES	124479
BOX	722819
CARRIERS	257258
CARRIER	949858
CONTAINERS	277969
CONTAINER	845561
(7 AND (BOXES OR CARRIERS OR CONTAINERS)).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	18
(L7 AND (BOXES OR CARRIERS OR CONTAINERS)).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	18

US Patents Full-Text Database US Pre-Grant Publication Full-Text Database UPO Abstracts Database EPO Abstracts Database Derwent World Patents Index IBM Technical Disclosure Bulletins  17 near5 boxes  Recall Text Clear	Refine Search
Search Hist	ory

DATE: Thursday, June 19, 2003 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB = USPT	PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ		
<u>L8</u>	L7 and (boxes or carriers or containers)	18	<u>L8</u>
<u>L7</u>	l3 and (angle same nozzle)	20	<u>L7</u>
<u>L6</u>	L5 and angl\$	17	<u>L6</u>
<u>L5</u>	L3 and (spray nozzles)	26	<u>L5</u>
<u>L4</u>	L3 and (angle spray nozzles)	0	<u>L4</u>
<u>L3</u>	L2 and rotor	108	<u>L3</u>
<u>L2</u>	L1 and enclosure	1736	<u>L2</u>
<u>L1</u>	(cleaning system) or (cleaning apparatus)	34690	<u>L1</u>

**END OF SEARCH HISTORY** 

## WEST

**Generate Collection** 

**Print** 

## **Search Results -** Record(s) 1 through 10 of 26 returned.

1. Document ID: US 20030062069 A1

L5: Entry 1 of 26 File: PGPB

Apr 3, 2003

PGPUB-DOCUMENT-NUMBER: 20030062069

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030062069 A1

TITLE: Apparatus and methods for removing metallic contamination from wafer containers

PUBLICATION-DATE: April 3, 2003

INVENTOR-INFORMATION:

CITY COUNTRY NAME STATE RULE-47 Breese, Ronald G. Kalispell MTUS Bryer, C. James Kalispell MTUS Bergman, Eric J. Kalispell MT US Scranton, Dana R. Kalispell MT US

US-CL-CURRENT: <u>134/33</u>; <u>134/103.2</u>, <u>134/134</u>, <u>134/140</u>, <u>134/88</u>

## ABSTRACT:

In a method for cleaning for cleaning metallic ion contamination, and especially copper, from wafer containers, the containers are loaded into a <u>cleaning apparatus</u>. The containers are sprayed with a dilute chelating agent solution. The chelating agent solution removes metallic contamination from the containers. The containers are then rinsed with a rinsing liquid, such as deionized water and a surfactant. The containers are then dried, preferably by applying heat and/or hot air movement.

Full Title Citation From	it Review Classification D	ate Reference Sequenc	es Attachments Clair	ns RMC	Draw Desc   Image	
2. Documen	nt ID: US 2003005	51743 Al				
L5: Entry 2 of 26		File:	PGPB		Mar 20,	2003

PGPUB-DOCUMENT-NUMBER: 20030051743

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030051743 A1

TITLE: Apparatus and methods for removing metallic contamination from wafer containers

PUBLICATION-DATE: March 20, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Breese, Ronald G.	Kalispell	MT	US	
Bryer, C. James	Kalispell	MT	US	
Bergman, Eric J.	Kalispell	MT	US	
Scranton, Dana R.	Kalispell	MT	US	

US-CL-CURRENT: 134/33; 134/103.2, 134/134, 134/140, 134/88

#### ABSTRACT:

In a method for cleaning for cleaning metallic ion contamination, and especially copper, from wafer containers, the containers are loaded into a loader of a <u>cleaning apparatus</u>. The containers are sprayed with a dilute chelating agent solution, while the <u>rotor</u> is spinning. The chelating agent solution removes metallic contamination from the <u>containers</u>. The containers are then sprayed with a rinsing liquid, such as deionized water and a surfactant while the <u>rotor</u> is spinning and heat is applied. The containers are then dried by applying heat, hot air movement and spinning the rotor.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	EVAC	Drain Desc	[mage

3. Document ID: US 20030010362 A1

L5: Entry 3 of 26 File: PGPB

Jan 16, 2003

PGPUB-DOCUMENT-NUMBER: 20030010362

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030010362 A1

TITLE: Systems and methods for processing workpieces

PUBLICATION-DATE: January 16, 2003

INVENTOR - INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Scranton, Dana	Kalispell	MT	US	
Bergman, Eric	Kalispell	MT	US	
Lund, Eric	Kent	AW	US	
Lanfrankie, Joe	Kent	AW	US	
Lund, Worm	Kent	AW	US	

US-CL-CURRENT: 134/30; 134/155, 134/186, 134/33, 134/902, 134/99.1

#### ABSTRACT:

Workpieces requiring low levels of contamination, such as semiconductor wafers, are loaded into a rotor within a process chamber. The process chamber has a horizontal drain opening in its cylindrical wall. The chamber is closed via a door. A process or rinsing liquid is introduced into the chamber. The liquid rises to a level so that the workpieces are immersed in the liquid. The chamber slowly pivots or rotates to move the drain opening down to the level of the liquid. The liquid drains out through the drain opening. The drain opening is kept near the surface of the liquid to drain off liquid at a uniform rate. An organic solvent vapor is introduced above the liquid to help prevent droplets of liquid from remaining on the workpieces as the liquid drains off. The rotor spins the workpieces to help to remove any remaining droplets by centrifugal force.

***[	☐ 4. Document ID: US 20020157686 A1	Full Title	Citation   F	ront   F	Review	Classification	Date	Reference	Sequence	s Attachments	HWIC	Draw Desc		
***	4. Document ID: US 20020157686 A1													
	4. Document ID: US 20020137686 A1													

PGPUB-DOCUMENT-NUMBER: 20020157686

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020157686 A1

TITLE: Process and apparatus for treating a workpiece such as a semiconductor wafer

PUBLICATION-DATE: October 31, 2002

INVENTOR-INFORMATION:

NAME CITY STATE COUNTRY RULE-47 Kenny, Michael Kalispell МТ Kalispell Aegeter, Brian MT US Kalispell MT US Bergman, Eric Scranton, Dana Kalispell MT US

US-CL-CURRENT: <u>134/1.3</u>; <u>134/153</u>, <u>134/21</u>, <u>134/28</u>, <u>134/30</u>, <u>134/33</u>, <u>134/34</u>, <u>134/902</u>, 134/95.3

#### ABSTRACT:

In a system for cleaning a workpiece or wafer, a boundary layer of heated liquid is formed on the workpiece surface. Ozone is provided around the workpiece. The ozone diffuses through the boundary layer and chemically reacts with contaminants on the workpiece surface. A jet of high velocity heated liquid is directed against the workpiece, to physically dislodge or remove a contaminant from the workpiece. The jet penetrates through the boundary layer at the point of impact. The boundary layer otherwise remains largely undisturbed. Preferably, the liquid includes water, and may also include a chemical. Steam may also be jetted onto the workpiece, with the steam also physically removing contaminants, and also heating the workpiece to speed up chemical cleaning. The workpiece and the jet of liquid are moved relative to each other, so that substantially all areas of the workpiece surface facing the jet are exposed at least momentarily to the jet. Sonic or electromagnetic energy may also be introduced to the workpiece.

Full Title Citation Front Review Classification Date	Reference Sequences Attachmen	ts KWWC Draw Desc Image
5. Document ID: US 200201004	95 A1	
L5: Entry 5 of 26	File: PGPB	Aug 1, 2002

PGPUB-DOCUMENT-NUMBER: 20020100495

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020100495 A1

TITLE: Method and apparatus for cleaning containers

PUBLICATION-DATE: August 1, 2002

INVENTOR-INFORMATION:

NAME CITY STATE COUNTRY RULE-47
Bexten, Dan Kalispell MT US
Norby, Jerry Kalispell MT US

## ABSTRACT:

A machine for cleaning containers such as flat media carriers has inside and outside arrays of nozzles arranged to spray a cleaning solution onto containers supported on a spinning <u>rotor</u> in a chamber. The cleaning solution, a mixture of water and a detergent or surfactant, is prepared by drawing out surfactant directly from a surfactant bulk

storage vessel by means of a metering pump. The flow rate of the water is measured by a flow meter and in combination with the metering pump, a proper amount of surfactant is injected into the water line to produce a mixture with a desired surfactant concentration for removing contaminants. The mixture is injected into the water line at a mixing control valve to ensure that the water and surfactant are thoroughly mixed before being injected into the media carrier. Where the wafer carrier is provided with multiple rinse manifolds for spraying the carrier, a flow meter and mixing control valve are provided in the water inlet line for each manifold and a separate metering pump is provided for injecting surfactant into each water line to ensure that a proper amount of surfactant is injected into each water line to produce a surfactant/water mixture with a desired surfactant concentration.

Full Title Citation Front Review Classification Date Reference Sequences Attachments

KWIC Draw Deso Image

6. Document ID: US 20020096202 A1

L5: Entry 6 of 26

File: PGPB

Jul 25, 2002

PGPUB-DOCUMENT-NUMBER: 20020096202

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020096202 A1

TITLE: Wafer container cleaning system

PUBLICATION-DATE: July 25, 2002

INVENTOR - INFORMATION:

NAME CITY STATE COUNTRY RULE-47

Bexten, Dan Kalispell MT US Norby, Jerry Kalispell MT US

US-CL-CURRENT: <u>134/153</u>

## ABSTRACT:

A system and method for cleaning carriers used for handling semiconductor wafers including a box cleaner having a rotor within an enclosure. Box holder assemblies on the rotor include upper and lower hooks for securing boxes to the rotor. A box door holder assembly is also provided on the rotor. The box door holder assembly preferably has a plurality of box door holding positions. Each box door holding position advantageously has a door guide and door hooks for holding a door. The box door holder assembly allows both the boxes and their doors to be cleaned with the centrifugal cleaner, avoiding the need for separate cleaning of the doors. In one configuration, the rotor is provided with an even number of box holder assemblies symmetrically spaced about the rotor and an even number of door holder assemblies symmetrically spaced about the rotor.

Full Title Citation Front Review Classification Date Reference Sequences Attachments

KMIC Draw Desc Image

7. Document ID: US 20020028501 A1

L5: Entry 7 of 26

File: PGPB

Mar 7, 2002

PGPUB-DOCUMENT-NUMBER: 20020028501

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020028501 A1

TITLE: System and method for vent hood cleaning and comprehensive bioremediation of kitchen grease

4 of 7

PUBLICATION-DATE: March 7, 2002

INVENTOR-INFORMATION:

NAME CITY STATE COUNTRY RULE-47

McMinn, Pearson Vernie JR. San Angelo TX US

US-CL-CURRENT: 435/264; 435/289.1

## ABSTRACT:

A commercial and institutional kitchen retrofit system for 1. the automatic daily cleaning of commercial kitchen exhaust hoods and flues, 2. a low pressure, low volume, recirculating cleaning system designed for the removal of oily residue from hard surfaces and the accelerated bioremediation of the resulting collective hydrocarbon waste, 3. the collection and elimination of roof-top grease accumulations, 4. the systematic on site incubation and enhanced propagation of cultured, hydrocarbon specific, bacterial microorganisms in an automatically mixed aqueous solution containing PH neutral oxidizers and hydrocarbon base emulsifiers altogether, producing a regenerative, recyclable cleaning solution specifically developed for use in 5. and the automatic daily introduction of an oxygen enriched, microbe charged solution into kitchen drain lines, thereby reducing the stoppage of drains caused by the solidification of grease and ultimately promoting the biodigestation and reduction of accumulated grease in the main grease trap integral to the sewer system.

Full   Title   Citation   Front   Review   Classification	Date Reference Sequences Attachments	KMMC   Draw Desc   Image
8. Document ID: US 20010	0047812 A1	•
L5: Entry 8 of 26	File: PGPB	Dec 6, 2001

PGPUB-DOCUMENT-NUMBER: 20010047812

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010047812 A1

TITLE: CLEANING APPARATUS

PUBLICATION-DATE: December 6, 2001

INVENTOR-INFORMATION:

NAME CITY STATE COUNTRY RULE-47 BRYER, CHARLES JAMES KALISPELL MΤ US BEXTEN, DANIEL P. KALISPELL US MT NORBY, JERRY R. KALISPELL MTUS

## ABSTRACT:

A machine for cleaning containers has inside and outside arrays of nozzles arranged to spray a cleaning solution onto containers supported on a spinning <a href="rotor">rotor</a>. Used cleaning solution is diverted to a reclaim tank for reuse, thereby allowing <a href="low-cost cleaning">low-cost cleaning</a> with concentrated chemicals, and with the creation of less liquid waste requiring disposal. In a method for removing contaminants from flat media or silicon wafer containers or carriers, a mixture of surfactant and de-ionized water is sprayed onto containers on a spinning <a href="rotor">rotor</a>. The used cleaning solution is collected, filtered and reused.



9. Document ID: US 6432214 B1

L5: Entry 9 of 26

File: USPT

Aug 13, 2002

US-PAT-NO: 6432214

DOCUMENT-IDENTIFIER: US 6432214 B1

TITLE: Cleaning apparatus

DATE-ISSUED: August 13, 2002

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Bryer; Charles James Kalispell MT Bexten; Daniel P. Kalispell MT Norby; Jerry R. Kalispell MT

US-CL-CURRENT:  $\frac{134}{10}$ ;  $\frac{134}{111}$ ,  $\frac{134}{153}$ ,  $\frac{134}{25.1}$ ,  $\frac{134}{25.4}$ ,  $\frac{134}{25.5}$ ,  $\frac{134}{26}$ ,  $\frac{134}{29}$ ,  $\frac{134}{902}$ ,  $\frac{134}{95.3}$ 

## ABSTRACT:

A machine for cleaning containers has inside and outside arrays of nozzles arranged to spray a cleaning solution onto containers supported on a spinning <u>rotor</u>. Used cleaning solution is diverted to a reclaim tank for reuse, thereby allowing low-cost cleaning with concentrated chemicals, and with the creation of less liquid waste requiring disposal. In a method for removing contaminants from flat media or silicon wafer containers or carriers, a mixture of surfactant and de-ionized water is sprayed onto containers on a spinning <u>rotor</u>. The used cleaning solution is collected, filtered and reused.

18 Claims, 11 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 10

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments

KWMC Draw Desc Image

10. Document ID: US 6412502 B1

L5: Entry 10 of 26 File: USPT Jul 2, 2002

US-PAT-NO: 6412502

DOCUMENT-IDENTIFIER: US 6412502 B1

TITLE: Wafer container cleaning system

DATE-ISSUED: July 2, 2002

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Bexten; Daniel P. Kalispell MT Norby; Jerry R. Kalispell MT

US-CL-CURRENT: <u>134/148</u>; <u>134/104.1</u>, <u>134/158</u>, <u>134/184</u>, <u>134/61</u>, <u>134/80</u>, <u>134/902</u>

ABSTRACT:

A <u>cleaning system</u> for cleaning boxes or containers used to carry semiconductor wafers

has box holder assemblies and a box door holder assembly attached to a  $\underline{\text{rotor}}$  within an  $\underline{\text{enclosure}}$ . Upper and lower hooks on the box holder and box door holder  $\underline{\text{assemblies}}$  hold boxes and doors as the  $\underline{\text{rotor}}$  spins. Boxes and their doors, such as front opening unified pods (FOUP) are both efficiently cleaned and handled.

21 Claims, 12 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 10

Full Title	Citation   Front	Review Classificat	on Date Reference	Sequences	Attachments	KMMC   Draw Deso   Image
			Generate Coll			

Term	
SPRAY	350805
SPRAYS	49009
NOZZLES	202267
NOZZLE	527815
(3 AND (SPRAY ADJ NOZZLES)).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	26
(L3 AND (SPRAY NOZZLES)).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	· 26

Display Format: - Change Format

Previous Page Next Page

## WEST

**Generate Collection** 

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## Search Results - Record(s) 11 through 20 of 26 returned.

11. Document ID: US 6322633 B1

L5: Entry 11 of 26

File: USPT

Nov 27, 2001

US-PAT-NO: 6322633

DOCUMENT-IDENTIFIER: US 6322633 B1

TITLE: Wafer container cleaning system

DATE-ISSUED: November 27, 2001

INVENTOR-INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Bexten; Daniel P.

Kalispell Kalispell MT

Norby; Jerry R. Kalis

US-CL-CURRENT:  $\frac{134}{1}$ ;  $\frac{134}{134}$ ,  $\frac{134}$ 

## ABSTRACT:

A <u>cleaning system</u> for cleaning carriers or containers used to carry semiconductor wafers has a door cleaner adjacent to a centrifugal box cleaner. Box holder assemblies are attached to a <u>rotor</u> within the box cleaner. Upper and lower hooks on the box holder assemblies hold boxes as the <u>rotor</u> spins. The door cleaner has a base which holds doors in a vertical and upright position. An elevator lowers the base into an ultrasonic cleaning tank. The tank lid seals the tank during use. Ultrasonic cleaning fluid is filtered and cycled into and out of the tank. Boxes and their doors, such as front opening unified pods (FOUP) are both efficiently cleaned and handled.

29 Claims, 10 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 8

_													
Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	HONC	Draw Desc	Image
C. C.													

12. Document ID: US 6315648 B1

L5: Entry 12 of 26

File: USPT

Nov 13, 2001

US-PAT-NO: 6315648

DOCUMENT-IDENTIFIER: US 6315648 B1

TITLE: Apparatus for pressure treating a surface

DATE-ISSUED: November 13, 2001

INVENTOR-INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Neer; Dana L.

Apollo Beach

FL

33572

US-CL-CURRENT: 451/92; 451/75

#### ABSTRACT:

An improved high-capacity apparatus for rapidly pressure treating a large surface area, such as the hull of a cargo ship or a large storage tank, using high-pressure spray. The apparatus conforms to the surface to be treated and provides the treating power of multiple rotating nozzles. The apparatus preferably comprises a framework comprised of one or more frame members; at least one rotary spray unit flexibly associated with each frame member, each rotary spray unit comprising at least one rotary spray arm having at least one nozzle directed away from the framework, a high pressure surface treatment medium supply conduit, a rotary union having an axis of rotation and connecting the high pressure medium supply conduit with the rotary spray arm; enclosure means for individually and/or collectively enclosing the rotary spray units against the surface being treated; rotary spray unit positioning means for individually positioning each of the respective rotary spray units relative to the surface being treated; primary framework positioning means for orienting the framework along the surface to be treated relative to secondary means positioning means and adapted for providing constant bias of the framework against the surface being treated; and secondary framework positioning means for supporting and moving the primary framework positioning means relative to the surface to be treated.

25 Claims, 95 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 67

Full Title Citation Front Review Classification Date Reference Sequences Attachments Claims KWIC Draw Desc Image

13. Document ID: US 6274375 B1

L5: Entry 13 of 26

File: USPT

Aug 14, 2001

US-PAT-NO: 6274375

DOCUMENT-IDENTIFIER: US 6274375 B1

TITLE: System and method for vent hood cleaning and comprehensive bioremediation of

kitchen grease

DATE-ISSUED: August 14, 2001

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

McMinn, Jr.; Pearson Vernie San Angelo TX

US-CL-CURRENT: 435/289.1; 210/167, 210/170, 210/191, 210/195.1, 210/201, 210/207,

210/513, 210/538, 435/294.1

## ABSTRACT:

A commercial and institutional kitchen retrofit system for 1. the automatic daily cleaning of commercial kitchen exhaust hoods and flues, 2. a low pressure, low volume, recirculating cleaning system designed for the removal of oily residue from hard surfaces and the accelerated bioremediation of the resulting collective hydrocarbon waste, 3. the collection and elimination of roof-top grease accumulations, 4. the systematic on site incubation and enhanced propagation of cultured, hydrocarbon specific, bacterial microorganisms in an automatically mixed aqueous solution containing PH neutral oxidizers and hydrocarbon base emulsifiers altogether, producing a regenerative, recyclable cleaning solution specifically developed for use in 5. and the automatic daily introduction of an oxygen enriched, microbe charged solution into kitchen drain lines, thereby reducing the stoppage of drains caused by the solidification of grease and ultimately promoting the biodigestation and reduction of accumulated grease in the main grease trap integral to the sewer system.

1 Claims, 12 Drawing figures

Exemplary Claim Number: 1 Number of Drawing Sheets: 12

Full Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | MMC | Draw Desc | Image |

14. Document ID: US 5972127 A

L5: Entry 14 of 26

File: USPT

Oct 26, 1999

US-PAT-NO: 5972127

DOCUMENT-IDENTIFIER: US 5972127 A

TITLE: Methods for centrifugally cleaning wafer carriers

DATE-ISSUED: October 26, 1999

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Thompson; Raymon F. Kalispell MT 59904 Owczarz; Aleksander Kalispell MT 59904

US-CL-CURRENT: <u>134/33</u>; <u>134/103.2</u>, <u>134/153</u>, <u>134/37</u>, <u>134/902</u>, <u>134/95.2</u>, <u>134/95.3</u>,

<u>134/99.1</u>

ABSTRACT:

A process for cleaning carriers used to hold semiconductor articles includes loading a carrier on a <u>rotor</u> within a processing chamber. The <u>rotor</u> is rotated while spraying cleaning liquid onto the carrier. A flow of primary drying gas is induced through the processing chamber via the centrifugal action of the <u>rotor</u>. Secondary drying gas is sprayed onto the carriers from nozzles. Carriers are loaded onto carrier supports on the rotor, and are held in place with removable baskets.

38 Claims, 15 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 14

Full Title Citation Front Review Classification Date Reference Sequences Attachments

MMC Draw Desc Image

15. Document ID: US 5874292 A

L5: Entry 15 of 26

File: USPT Feb 23, 1999

US-PAT-NO: 5874292

DOCUMENT-IDENTIFIER: US 5874292 A

TITLE: System and method for vent hood cleaning and comprehensive bioremediation of

kitchen grease

DATE-ISSUED: February 23, 1999

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

McMinn, Jr.; Pearson Vernie San Angelo TX 76901

US-CL-CURRENT: 435/262; 126/299E, 126/299F, 126/299R, 435/264

ABSTRACT:

A commercial and institutional kitchen retrofit system for 1. the automatic daily cleaning of commercial kitchen exhaust hoods and flues, 2. a low pressure, low volume, recirculating cleaning system designed for the removal of oily residue from hard surfaces and the accelerated bioremediation of the resulting collective hydrocarbon waste, 3. the collection and elimination of roof-top grease accumulations, 4. the systematic on site incubation and enhanced propagation of cultured, hydrocarbon specific, bacterial microorganisms in an automatically mixed aqueous solution containing PH neutral oxidizers and hydrocarbon base emulsifiers altogether, producing a regenerative, recyclable cleaning solution specifically developed for use in 5. and the automatic daily introduction of an oxygen enriched, microbe charged solution into kitchen drain lines, thereby reducing the stoppage of drains caused by the solidification of grease and ultimately promoting the biodigestation and reduction of accumulated grease in the main grease trap integral to the sewer system.

9 Claims, 9 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 9

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments

RVMC Draw Desc Image

16. Document ID: US 5810895 A

L5: Entry 16 of 26

File: USPT

Sep 22, 1998

COUNTRY

US-PAT-NO: 5810895

DOCUMENT-IDENTIFIER: US 5810895 A

TITLE: Rotating pack bed filter with continuous cleaning system

DATE-ISSUED: September 22, 1998

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE

Staehle; Richard C. Flemington NJ
Cash; James T. Hackettstown NJ

US-CL-CURRENT: <u>55/282</u>; <u>55/400</u>

ABSTRACT:

Apparatus for removing a wide variety of differing solid and aerosol waste materials from effluent or exhaust streams produced by an industrial process. This invention may be especially useful as a pre- or post-conditioner of the effluent to prevent plugging in any number of available pollution control devices. More particularly, a rotating pack bed filter removes solid and aerosol waste materials, if present, from an effluent and simultaneously regenerates the filter media by (1) heating to thermally decompose the collected material trapped in the filter media into a residue and to drive off gaseous pollutants carried by the collected material and (2) cleaning to remove the residue from the media.

24 Claims, 29 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 7

Full Tille Citation Front Review Classification Date Reference Sequences Attachments

KMMC Draw Desc Image

17. Document ID: US 5804507 A

L5: Entry 17 of 26 File: USPT Sep 8, 1998

US-PAT-NO: 5804507

DOCUMENT-IDENTIFIER: US 5804507 A

TITLE: Radially oscillating carousel processing system for chemical mechanical

polishing

DATE-ISSUED: September 8, 1998

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Perlov; Ilya Santa Clara CA
Gantvarg; Eugene Santa Clara CA
Lee; Harry Q. Mountain View CA
Somekh; Sasson Los Altos Hills CA
Tolles; Robert D. Santa Clara CA

US-CL-CURRENT: 438/692; 134/33, 156/345.12

#### ABSTRACT:

An apparatus for polishing semiconductor wafers and other workpieces that includes a polishing pads mounted on respective platens at multiple polishing stations. Multiple wafer heads, at least one greater in number than the number of polishing stations, can be loaded with individual wafers. The wafer heads are suspended from a carousel, which provides circumferential positioning of the heads relative to the polishing pads, and the wafer heads oscillate radially as supported by the carousel to sweep linearly across the respective pads in radial directions with respect to the rotatable carousel. Each polishing station includes a pad conditioner to recondition the polishing pad so that it retains a high polishing rate. Washing stations may be disposed between polishing stations and between the polishing stations and a transfer and washing station to wash the wafer as the carousel moves. A transfer and washing station is disposed similarly to the polishing pads. The carousel simultaneously positions one of the heads over the transfer and washing station while the remaining heads are located over polishing stations for wafer polishing so that loading and unloading of wafers and washing of wafers and wafer heads can be performed concurrently with wafer polishing. A robot positioned to the side of the polishing apparatus automatically moves cassettes filled with wafers into a holding tub, and transfers individual wafers vertically held in the cassettes between the holding tub and the transfer and washing station. The multiple polishing pads can be used to sequentially polish a wafer held in a wafer head in a step of multiple steps. The steps may be equivalent, may provide polishes of different finish, or may be directed to polishing different levels.

84 Claims, 117 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 74

Full Title Citation Front Review Classification Date Reference Sequences Attachments

KVMC Draw Desc Image

18. Document ID: US 5738574 A

L5: Entry 18 of 26

File: USPT

Apr 14, 1998

US-PAT-NO: 5738574

DOCUMENT-IDENTIFIER: US 5738574 A

TITLE: Continuous processing system for chemical mechanical polishing

DATE-ISSUED: April 14, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tolles; Robert D.	Santa Clara	CA		
Shendon; Norm	San Carlos	CA		
Somekh; Sasson	Los Altos Hills	CA		
Perlov; Ilya	Santa Clara	CA		
Gantvarg; Eugene	Santa Clara	CA		
Lee; Harry Q.	Mountain View	CA		

US-CL-CURRENT: <u>451/288</u>; <u>451/247</u>, <u>451/285</u>, <u>451/286</u>, <u>451/287</u>, <u>451/289</u>, <u>451/332</u>, <u>451/401</u>, 451/41

#### ABSTRACT:

An apparatus for polishing semiconductor wafers and other workpieces that includes polishing pads mounted on respective platens at multiple polishing stations. Multiple wafer heads, at least one greater in number than the number of polishing stations, can be loaded with individual wafers. The wafer heads are suspended from a carousel, which provides circumferential positioning of the heads relative to the polishing pads, and the wafer heads oscillate radially as supported by the carousel to sweep linearly across the respective pads in radial directions with respect to the rotatable carousel. Each polishing station includes a pad conditioner to recondition the polishing pad so that it retains a high polishing rate. Washing stations may be disposed between polishing stations and between the polishing stations and a transfer and washing station to wash the wafer as the carousel moves. A transfer and washing station is disposed similarly to the polishing pads. The carousel simultaneously positions one of the heads over the transfer and washing station while the remaining heads are located over polishing stations for wafer polishing so that loading and unloading of wafers and washing of wafers and wafer heads can be performed concurrently with wafer polishing. A robot positioned to the side of the polishing apparatus automatically moves cassettes filled with wafers into a holding tub, and transfers individual wafers vertically held in the cassettes between the holding tub and the transfer and washing station. The multiple polishing pads can be used to sequentially polish a wafer held in a wafer head in a step of multiple steps. The steps may be equivalent, may provide polishes of different finish, or may be directed to polishing different levels.

41 Claims, 120 Drawing figures Exemplary Claim Number: 17 Number of Drawing Sheets: 74

Full Title	Citation Front Review	Classification Date	Reference   Sequences	Attachments	KMC   Draw Des	c Image
TI 19	Document ID:					
. 1 اسسا						

US-PAT-NO: 5738128

DOCUMENT-IDENTIFIER: US 5738128 A

\*\* See image for Certificate of Correction \*\*

TITLE: Centrifugal wafer carrier cleaning apparatus

DATE-ISSUED: April 14, 1998

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Thompson; Raymon F. Lakeside MT Owczarz; Aleksander Kalispell MT

US-CL-CURRENT: 134/95.2; 134/153, 134/902, 134/95.3

ABSTRACT:

Apparatus (20) for cleaning carriers used to hold semiconductor wafers, substrates, data disks, flat panel displays and similar containers used in applications highly sensitive to contamination. The apparatus has a processing bowl (21) with entrance and exit ports (34, 36) through which carriers are installed and removed from processing chamber (21). Rotor (70) rotates within the processing chamber. Rotor (70) includes a rotor cage (71) which mounts detachable wafer carrier supports (214). Filtered, heated air is passed through the process chamber for drying. Cleaning liquid and additional drying gas can be supplied through manifolds (120, 110) positioned inside and outside rotor cage (71).

24 Claims, 17 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 14

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | 10MC | Drain Desc | Image

20. Document ID: US 5562113 A

L5: Entry 20 of 26

File: USPT

Oct 8, 1996

US-PAT-NO: 5562113

DOCUMENT-IDENTIFIER: US 5562113 A

\*\* See image for Certificate of Correction \*\*

TITLE: Centrifugal wafer carrier cleaning apparatus

DATE-ISSUED: October 8, 1996

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Thompson; Raymon F. Lakeside MT Owczarz; Aleksander Kalispell MT

US-CL-CURRENT: 134/95.2; 134/153, 134/902, 134/95.3

## ABSTRACT:

Apparatus (20) for cleaning carriers used to hold semiconductor wafers, substrates, data disks, flat panel displays and similar containers used in applications highly sensitive to contamination. The apparatus has a processing bowl (21) with entrance and exit ports (34, 36) through which carriers are installed and removed from processing chamber (21). Rotor (70) rotates within the processing chamber. Rotor (70) includes a rotor cage (71) which mounts detachable wafer carrier supports (214). Filtered, heated air is passed through the process chamber for drying. Cleaning liquid and additional drying gas can be supplied through manifolds (120, 110) positioned inside and outside rotor cage (71).

57 Claims, 13 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 13

Full Title Citation Front Review Classification Date Reference Sequences Attachments

FMMC Draw Desc Image

**Generate Collection** 

Print

Term	Documents
SPRAY	350805
SPRAYS	49009
NOZZLES	202267
NOZZLE	527815
(3 AND (SPRAY ADJ NOZZLES)).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	26
(L3 AND (SPRAY NOZZLES)).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	26

<b>Display Format:</b>	-	Change Format
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<u>Previous Page</u> <u>Next Page</u>

## WEST

**Generate Collection** 

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## Search Results - Record(s) 21 through 26 of 26 returned.

21. Document ID: US 5224503 A

L5: Entry 21 of 26

File: USPT

Jul 6, 1993

US-PAT-NO: 5224503

DOCUMENT-IDENTIFIER: US 5224503 A

TITLE: Centrifugal wafer carrier cleaning apparatus

DATE-ISSUED: July 6, 1993

INVENTOR-INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Thompson; Raymon F.

Lakeside

MΤ

Owczarz; Aleksander

Kalispell

MT

US-CL-CURRENT: 134/95.2; 134/153, 134/902, 134/95.3

#### ABSTRACT:

Apparatus for cleaning carriers used to hold semiconductor wafers, substrates, data disks, flat panel displays and similar containers used in applications highly sensitive to contamination. The apparatus has a processing bowl with entrance and exit ports through which carriers are installed and removed from a processing chamber. A rotor rotates within the processing chamber. The rotor includes a rotor cage which mounts detachable wafer carrier supports. Filtered, heated air is passed through the process chamber for drying. Cleaning liquid and additional drying gas can be supplied through manifolds positioned inside and outside the rotor cage.

55 Claims, 15 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 14

Full Title Citation Front Review Classification Date Reference Sequences Attachments Claims RMC Draw Desc Image

22. Document ID: US 4813602 A

L5: Entry 22 of 26

File: USPT

Mar 21, 1989

US-PAT-NO: 4813602

DOCUMENT-IDENTIFIER: US 4813602 A

TITLE: Pulsating liquid cleaning device

DATE-ISSUED: March 21, 1989

INVENTOR-INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Corey; Paul

Del Mar

CA

92014

US-CL-CURRENT: 239/101; 222/246, 222/387, 239/331, 433/90

#### ABSTRACT:

A cleaning apparatus for generating a pulsed liquid stream, comprising a fluid tight housing having a cylindrical side wall, and first and second ends being compact enough to be hand held by a user. A piston mounted in the housing forms a liquid tight seal with the sides of the housing and slides between a first and a second position in response to an actuation means operated by hand pressure. An output port in the second end of the housing is connected to a nozzle for directing liquid at a desirable location. A liquid control means connected between the output port and the nozzle receives pressurized liquid exiting through the output port and transfers discrete portions of the liquid to the nozzle forming a pulsative stream of liquid exiting the nozzle.

The liquid control means can comprise a rod connected to the piston and extending toward the output port with a plurality of cylindrical pluqs secured thereto at intervals determined by a desired length or fluid quantity for pulses in said pulsative stream, each plug having a length commensurate with desired periodicity for pulses in said pulsative stream, and a diameter as close to that of said output port as possible without preventing the movement through the output port.

In addition, a liquid tight, flexible or static bladder for confining predetermined portions of a desired cleaning solution can be employed within the apparatus housing.

7 Claims, 7 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 2

## Full Title Citation Front Review Classification Date Reference Sequences Attachments Claims MMC Draw Desc Image

23. Document ID: US 4676261 A

L5: Entry 23 of 26

File: USPT

Jun 30, 1987

US-PAT-NO: 4676261

DOCUMENT-IDENTIFIER: US 4676261 A

TITLE: Hot tank spray washer and controls

DATE-ISSUED: June 30, 1987

INVENTOR-INFORMATION:

NAME

STATE ZIP CODE COUNTRY CITY

Blaul; Ronald L. Crystal Lake

US-CL-CURRENT: <u>134/57R</u>; <u>134/104.4</u>, <u>134/111</u>, <u>134/200</u>

## ABSTRACT:

Hot tank washer for cyclically repeated temporary intervals of spray cleaning operation, and controls therefor automatically coordinating operation of the system initiating switch, a heat interruption switch, and a door switch with one another and with other system operations. The heat interruption switch inherently puts the hot tank heating on standby momentarily with no power, incident to the user operating the spray system initiating switch; the spray system comes on under full power, incident to, and only contingent upon, the hot tank heating being first put on standby with no power; the spray system and a washer defogger system are automatically secured from operation, incident to the door switch being operated by opening of an access door allowing new work to be put into the washer.

23 Claims, 11 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 3

Full Title Citation Front Review Classification Date Reference Sequences Attachments

FMIC Draw Desc Image

24. Document ID: US 4561903 A

L5: Entry 24 of 26

File: USPT

IL

Dec 31, 1985

US-PAT-NO: 4561903

DOCUMENT-IDENTIFIER: US 4561903 A

TITLE: Method of solvent spray cleaning in an enclosed chamber

DATE-ISSUED: December 31, 1985

INVENTOR - INFORMATION:

NAME

CITY

STATE ZIP CODE

COUNTRY

Blaul; Ronald L.

Crystal Lake

US-CL-CURRENT:  $\underline{134/10}$ ;  $\underline{134/104.4}$ ,  $\underline{134/111}$ ,  $\underline{134/113}$ ,  $\underline{134/18}$ ,  $\underline{134/200}$ ,  $\underline{454/56}$ ,  $\underline{55/385.1}$ 

#### ABSTRACT:

High pressure washing method utilizing a hand directed <u>spray nozzle</u> for cleaning parts, by eye through a viewing window, and an enclosing chamber containing the parts in a manner whereby the zone for solvent <u>spray</u> by the <u>nozzle</u> is closely confined within the <u>enclosure</u> so as not to expose the operator or the outside environment to the liquid <u>runoff of</u> the solvent, or to the sprayed particles thereof, or to solvent steam or rising vapors. With a view to ecology considerations, and in addition to the concern to confine the contaminant from escaping into the environment, the internal air of the chamber and all solvent are continually recycled for re-use according to the washing procedure. Such procedure entails, in the practice of the instant invention, keeping down the vapor concentration by defogging the chamber air, and simultaneously defogging the viewing window through blanketing same by the defogged air as recycled.

13 Claims, 11 Drawing figures Exemplary Claim Number: 9 Number of Drawing Sheets: 3

Full Title Citation Front Review Classification Date Reference Sequences Attachments

KWIC Draw Desc Image

25. Document ID: US 4182001 A

L5: Entry 25 of 26

File: USPT

Jan 8, 1980

US-PAT-NO: 4182001

DOCUMENT-IDENTIFIER: US 4182001 A

TITLE: Surface cleaning and rinsing device

DATE-ISSUED: January 8, 1980

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Krause; Helmuth W. Westport CT 06880

US-CL-CURRENT: 15/320; 15/385

ABSTRACT:

A surface cleaning and rinsing device has a <u>rotor</u> rotatable in a housing with the underside of the <u>rotor</u> being provided with a <u>plurality</u> of suction nozzles and a plurality of orbitally rotating brushes positioned between said suction nozzles. Adjustable <u>spray nozzles</u> are also provided on the underside of the <u>rotor</u> for spraying a cleaning liquid onto the surface to be cleaned in advance of the brushes with respect to the direction of rotation of the <u>rotor</u>, or liquid supply means dispenses the liquid through the brushes themselves, with each of the suction nozzles serving to extract the liquid and loosened dirt immediately after brushing has occurred. The outer peripheries of the brushes are caused to rotate in the opposite direction from the <u>rotor</u> itself, and the brushes are turning at a rotational speed significantly faster than the <u>rotor</u>; therefore, they are able to lift up and flip over the pile of a rug being cleaned for also cleansing the underside of the pile. An advantageous cyclical scrubbing action on the pile is produced, in which the liquid-dwell-time is machine controlled, and very little over-all liquid is required per square yard of floor covering for achieving thorough cleaning and rinsing.

14 Claims, 13 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 4

Full Title Cdation Front Review Classification Date Reference Sequences Attachments MMC Draw Desc Image

26. Document ID: US 3594842 A

L5: Entry 26 of 26 File: USPT Jul 27, 1971

US-PAT-NO: 3594842

DOCUMENT-IDENTIFIER: US 3594842 A

TITLE: BOOM SUPPORTED BRUSH

DATE-ISSUED: July 27, 1971

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Clark; Gaylord J. Coloma Township, Berrien County MI 49038

US-CL-CURRENT: 15/53.1; 15/53.2, 15/DIG.2

## ABSTRACT:

An upright post and attached boom are supported for movement along a path substantially around a zone on a surface for supporting a motor vehicle. The post and boom support spray nozzles connected to a source of liquid under pressure and arranged to direct liquid continuously at a vehicle supported in said zone as said post moves along said path. Brush means are mounted upon the post and/or boom and continuously urged against the surfaces of the vehicle toward which the liquid is discharged.

6 Claims, 12 Drawing figures Number of Drawing Sheets: 4

Full Title Citation Front Review Classification Date Reference Sequences Attachments FAMC Draw Desc Image

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Term	Documents
SPRAY	350805
SPRAYS	49009
NOZZLES	202267
NOZZLE	527815
(3 AND (SPRAY ADJ NOZZLES)).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	26
(L3 AND (SPRAY NOZZLES)).USPT,PGPB,JPAB,EPAB,DWPI,TDBD.	26

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**Generate Collection** 

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## **Search Results - Record(s)** 1 through 10 of 17 returned.

File: PGPB

1. Document ID: US 20030062069 A1

L6: Entry 1 of 17

Apr 3, 2003

PGPUB-DOCUMENT-NUMBER: 20030062069

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030062069 A1

TITLE: Apparatus and methods for removing metallic contamination from wafer containers

PUBLICATION-DATE: April 3, 2003

INVENTOR - INFORMATION:

NAME CITY STATE COUNTRY RULE-47 Breese, Ronald G. Kalispell MT US Bryer, C. James Kalispell MT US Bergman, Eric J. Kalispell MTUS Scranton, Dana R. US Kalispell MT

US-CL-CURRENT: 134/33; 134/103.2, 134/134, 134/140, 134/88

## ABSTRACT:

In a method for cleaning for cleaning metallic ion contamination, and especially copper, from wafer containers, the containers are loaded into a <u>cleaning apparatus</u>. The containers are sprayed with a dilute chelating agent solution. The chelating agent solution removes metallic contamination from the containers. The containers are then rinsed with a rinsing liquid, such as deionized water and a surfactant. The containers are then dried, preferably by applying heat and/or hot air movement.

	non Pare Neierence Sequences Attachments Claims	
2. Document ID: US 200	30051743 A1	
L6: Entry 2 of 17	File: PGPB	Mar 20, 2003

Full Title Citation Front Review Classification Date Reference Settlebres Strackments Claims MMC Draw Dace Impos

PGPUB-DOCUMENT-NUMBER: 20030051743

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030051743 A1

TITLE: Apparatus and methods for removing metallic contamination from wafer containers

PUBLICATION-DATE: March 20, 2003

INVENTOR - INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Breese, Ronald G.	Kalispell	MT	US	
Bryer, C. James	Kalispell	MT	US	
Bergman, Eric J.	Kalispell	MT	US	
Scranton, Dana R.	Kalispell	MT	US	

US-CL-CURRENT: 134/33; 134/103.2, 134/134, 134/140, 134/88

#### ABSTRACT:

In a method for cleaning for cleaning metallic ion contamination, and especially copper, from wafer containers, the containers are loaded into a loader of a <u>cleaning apparatus</u>. The containers are sprayed with a dilute chelating agent solution, while the <u>rotor</u> is spinning. The chelating agent solution removes metallic contamination from the containers. The containers are then sprayed with a rinsing liquid, such as deionized water and a surfactant while the <u>rotor</u> is spinning and heat is applied. The containers are then dried by applying heat, hot air movement and spinning the rotor.

- 1	Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	HAMIC	Drawi Desc	egemi	
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## 3. Document ID: US 20030010362 A1

L6: Entry 3 of 17

File: PGPB

Jan 16, 2003

PGPUB-DOCUMENT-NUMBER: 20030010362

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030010362 A1

TITLE: Systems and methods for processing workpieces

PUBLICATION-DATE: January 16, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Scranton, Dana	Kalispell	MT	US	
Bergman, Eric	Kalispell	MT	US	
Lund, Eric	Kent	WA	US	
Lanfrankie, Joe	Kent	WA .	US	
Lund, Worm	Kent	WA	US	

US-CL-CURRENT: 134/30; 134/155, 134/186, 134/33, 134/902, 134/99.1

## ABSTRACT:

Workpieces requiring low levels of contamination, such as semiconductor wafers, are loaded into a rotor within a process chamber. The process chamber has a horizontal drain opening in its cylindrical wall. The chamber is closed via a door. A process or rinsing liquid is introduced into the chamber. The liquid rises to a level so that the workpieces are immersed in the liquid. The chamber slowly pivots or rotates to move the drain opening down to the level of the liquid. The liquid drains out through the drain opening. The drain opening is kept near the surface of the liquid to drain off liquid at a uniform rate. An organic solvent vapor is introduced above the liquid to help prevent droplets of liquid from remaining on the workpieces as the liquid drains off. The rotor spins the workpieces to help to remove any remaining droplets by centrifugal force.

Full Title Citation Front Review (	Classification   Date   Reference   Sequences   Attachments	MWC Diam Desc Image
4. Document ID: US	S 20020157686 A1	
L6: Entry 4 of 17	File: PGPB	Oct 31, 2002

PGPUB-DOCUMENT-NUMBER: 20020157686

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020157686 A1

TITLE: Process and apparatus for treating a workpiece such as a semiconductor wafer

PUBLICATION-DATE: October 31, 2002

INVENTOR-INFORMATION:

NAME CITY STATE COUNTRY RULE-47 Kenny, Michael Kalispell MTUS Aegeter, Brian Kalispell MT US Bergman, Eric Kalispell US MT Scranton, Dana Kalispell MT US

US-CL-CURRENT:  $\underline{134}/\underline{1.3}$ ;  $\underline{134}/\underline{153}$ ,  $\underline{134}/\underline{21}$ ,  $\underline{134}/\underline{28}$ ,  $\underline{134}/\underline{30}$ ,  $\underline{134}/\underline{33}$ ,  $\underline{134}/\underline{34}$ ,  $\underline{134}/\underline{902}$ , 134/95.3

#### ABSTRACT:

In a system for cleaning a workpiece or wafer, a boundary layer of heated liquid is formed on the workpiece surface. Ozone is provided around the workpiece. The ozone diffuses through the boundary layer and chemically reacts with contaminants on the workpiece surface. A jet of high velocity heated liquid is directed against the workpiece, to physically dislodge or remove a contaminant from the workpiece. The jet penetrates through the boundary layer at the point of impact. The boundary layer otherwise remains largely undisturbed. Preferably, the liquid includes water, and may also include a chemical. Steam may also be jetted onto the workpiece, with the steam also physically removing contaminants, and also heating the workpiece to speed up chemical cleaning. The workpiece and the jet of liquid are moved relative to each other, so that substantially all areas of the workpiece surface facing the jet are exposed at least momentarily to the jet. Sonic or electromagnetic energy may also be introduced to the workpiece.

Full Title Citation Front	Review Classification Date	Reference Sequences Attachments	EVMC   Draw Desc   Image
5. Documen	t ID: US 200200285	501 A1	•
L6: Entry 5 of 17		File: PGPB	Mar 7, 2002

PGPUB-DOCUMENT-NUMBER: 20020028501

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020028501 A1

TITLE: System and method for vent hood cleaning and comprehensive bioremediation of kitchen grease

PUBLICATION-DATE: March 7, 2002

INVENTOR - INFORMATION:

NAME CITY COUNTRY STATE RULE-47

McMinn, Pearson Vernie JR. San Angelo

US-CL-CURRENT: 435/264; 435/289.1

## ABSTRACT:

A commercial and institutional kitchen retrofit system for 1. the automatic daily cleaning of commercial kitchen exhaust hoods and flues, 2. a low pressure, low volume, recirculating cleaning system designed for the removal of oily residue from hard surfaces and the accelerated bioremediation of the resulting collective hydrocarbon waste, 3. the collection and elimination of roof-top grease accumulations, 4. the systematic on site incubation and enhanced propagation of cultured, hydrocarbon

specific, bacterial microorganisms in an automatically mixed aqueous solution containing PH neutral oxidizers and hydrocarbon base emulsifiers altogether, producing a regenerative, recyclable cleaning solution specifically developed for use in 5. and the automatic daily introduction of an oxygen enriched, microbe charged solution into kitchen drain lines, thereby reducing the stoppage of drains caused by the solidification of grease and ultimately promoting the biodigestation and reduction of accumulated grease in the main grease trap integral to the sewer system.

☐ 6. Document ID: US 6412502 B1

L6: Entry 6 of 17

File: USPT

Jul 2, 2002

US-PAT-NO: 6412502

DOCUMENT-IDENTIFIER: US 6412502 B1

TITLE: Wafer container cleaning system

DATE-ISSUED: July 2, 2002

INVENTOR-INFORMATION:

NAME

CITY

Full Title Citation Front Review Classification Date Reference Sequences Attachments

STATE ZIP CODE

COUNTRY

MMC Draw Desc Image

Bexten; Daniel P. Norby; Jerry R.

Kalispell Kalispell MT MT

US-CL-CURRENT: 134/148; 134/104.1, 134/158, 134/184, 134/61, 134/80, 134/902

ABSTRACT:

A <u>cleaning system</u> for cleaning boxes or containers used to carry semiconductor wafers has box holder assemblies and a box door holder assembly attached to a <u>rotor</u> within an <u>enclosure</u>. Upper and lower hooks on the box holder and box door holder assemblies hold boxes and doors as the <u>rotor</u> spins. Boxes and their doors, such as front opening unified pods (FOUP) are both efficiently cleaned and handled.

21 Claims, 12 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 10

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments

EVMC Draw Desc Image

7. Document ID: US 6322633 B1

L6: Entry 7 of 17

File: USPT

Nov 27, 2001

US-PAT-NO: 6322633

DOCUMENT-IDENTIFIER: US 6322633 B1

TITLE: Wafer container cleaning system

DATE-ISSUED: November 27, 2001

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Bexten; Daniel P. Kalispell MT Norby; Jerry R. Kalispell MT 

### ABSTRACT:

A <u>cleaning system</u> for cleaning carriers or containers used to carry semiconductor wafers has a door cleaner adjacent to a centrifugal box cleaner. Box holder assemblies are attached to a <u>rotor</u> within the box cleaner. Upper and lower hooks on the box holder assemblies hold boxes as the <u>rotor</u> spins. The door cleaner has a base which holds doors in a vertical and upright position. An elevator lowers the base into an ultrasonic cleaning tank. The tank lid seals the tank during use. Ultrasonic cleaning fluid is filtered and cycled into and out of the tank. Boxes and their doors, such as front opening unified pods (FOUP) are both efficiently cleaned and handled.

29 Claims, 10 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 8

Full Title Citation Front Review Classification Date Reterence Sequences Attachments

EWAC Draw Desc Image

8. Document ID: US 6315648 B1

L6: Entry 8 of 17

File: USPT

Nov 13, 2001

US-PAT-NO: 6315648

DOCUMENT-IDENTIFIER: US 6315648 B1

TITLE: Apparatus for pressure treating a surface

DATE-ISSUED: November 13, 2001

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Neer; Dana L. Apollo Beach FL 33572

US-CL-CURRENT: 451/92; 451/75

## ABSTRACT:

An improved high-capacity apparatus for rapidly pressure treating a large surface area, such as the hull of a cargo ship or a large storage tank, using high-pressure spray. The apparatus conforms to the surface to be treated and provides the treating power of multiple rotating nozzles. The apparatus preferably comprises a framework comprised of one or more frame members; at least one rotary spray unit flexibly associated with each frame member, each rotary spray unit comprising at least one rotary spray arm having at least one nozzle directed away from the framework, a high pressure surface treatment medium supply conduit, a rotary union having an axis of rotation and connecting the high pressure medium supply conduit with the rotary spray arm; enclosure means for individually and/or collectively enclosing the rotary spray units against the surface being treated; rotary spray unit positioning means for individually positioning each of the respective rotary spray units relative to the surface being treated; primary framework positioning means for orienting the framework along the surface to be treated relative to secondary means positioning means and adapted for providing constant bias of the framework against the surface being treated; and secondary framework positioning means for supporting and moving the primary framework positioning means relative to the surface to be treated.

25 Claims, 95 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 67

Full Title Citation Front Review Classification Date Reference Sequences Attachments

EWiC Draw Desc Image

9. Document ID: US 6274375 B1

L6: Entry 9 of 17

File: USPT

Aug 14, 2001

US-PAT-NO: 6274375

DOCUMENT-IDENTIFIER: US 6274375 B1

TITLE: System and method for vent hood cleaning and comprehensive bioremediation of

kitchen grease

DATE-ISSUED: August 14, 2001

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

McMinn, Jr.; Pearson Vernie San Angelo TX

US-CL-CURRENT: 435/289.1; 210/167, 210/170, 210/191, 210/195.1, 210/201, 210/207,

210/513, 210/538, 435/294. 1

## ABSTRACT:

A commercial and institutional kitchen retrofit system for 1. the automatic daily cleaning of commercial kitchen exhaust hoods and flues, 2. a low pressure, low volume, recirculating cleaning system designed for the removal of oily residue from hard surfaces and the accelerated bioremediation of the resulting collective hydrocarbon waste, 3. the collection and elimination of roof-top grease accumulations, 4. the systematic on site incubation and enhanced propagation of cultured, hydrocarbon specific, bacterial microorganisms in an automatically mixed aqueous solution containing PH neutral oxidizers and hydrocarbon base emulsifiers altogether, producing a regenerative, recyclable cleaning solution specifically developed for use in 5. and the automatic daily introduction of an oxygen enriched, microbe charged solution into kitchen drain lines, thereby reducing the stoppage of drains caused by the solidification of grease and ultimately promoting the biodigestation and reduction of accumulated grease in the main grease trap integral to the sewer system.

1 Claims, 12 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 12

Full Title Citation Front Review Classification Date Reference Sequences Attachments

FAMIC Draw Desc Image

10. Document ID: US 5874292 A

L6: Entry 10 of 17

File: USPT

Feb 23, 1999

US-PAT-NO: 5874292

DOCUMENT-IDENTIFIER: US 5874292 A

TITLE: System and method for vent hood cleaning and comprehensive bioremediation of

kitchen grease

DATE-ISSUED: February 23, 1999

INVENTOR - INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

McMinn, Jr.; Pearson Vernie San Angelo TX 76901

US-CL-CURRENT: 435/262; 126/299E, 126/299F, 126/299R, 435/264

## ABSTRACT:

A commercial and institutional kitchen retrofit system for 1. the automatic daily cleaning of commercial kitchen exhaust hoods and flues, 2. a low pressure, low volume, recirculating cleaning system designed for the removal of oily residue from hard surfaces and the accelerated bioremediation of the resulting collective hydrocarbon waste, 3. the collection and elimination of roof-top grease accumulations, 4. the systematic on site incubation and enhanced propagation of cultured, hydrocarbon specific, bacterial microorganisms in an automatically mixed aqueous solution containing PH neutral oxidizers and hydrocarbon base emulsifiers altogether, producing a regenerative, recyclable cleaning solution specifically developed for use in 5. and the automatic daily introduction of an oxygen enriched, microbe charged solution into kitchen drain lines, thereby reducing the stoppage of drains caused by the solidification of grease and ultimately promoting the biodigestation and reduction of accumulated grease in the main grease trap integral to the sewer system.

9 Claims, 9 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 9

Full Til	lle Citation	Front Revie	cov Classification	Date Reference	Sequences	Attachments	EWIC	Draw Desc Imaç	e
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Term	Documents
ANGL\$	0
ANGL	148
ANGLA	8
ANGLABLE	18
ANGLABLY	1
ANGLADA	138
ANGLADAVIN	3
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11. Document ID: US 5810895 A

L6: Entry 11 of 17

File: USPT

Sep 22, 1998

US-PAT-NO: 5810895

DOCUMENT-IDENTIFIER: US 5810895 A

TITLE: Rotating pack bed filter with continuous cleaning system

DATE-ISSUED: September 22, 1998

INVENTOR-INFORMATION:

NAME

CITY

STATE

ZIP CODE

COUNTRY

Staehle; Richard C.

Flemington

NJ

Cash; James T.

Hackettstown

NJ

US-CL-CURRENT: 55/282; 55/400

#### ABSTRACT:

Apparatus for removing a wide variety of differing solid and aerosol waste materials from effluent or exhaust streams produced by an industrial process. This invention may be especially useful as a pre- or post-conditioner of the effluent to prevent plugging in any number of available pollution control devices. More particularly, a rotating pack bed filter removes solid and aerosol waste materials, if present, from an effluent and simultaneously regenerates the filter media by (1) heating to thermally decompose the collected material trapped in the filter media into a residue and to drive off gaseous pollutants carried by the collected material and (2) cleaning to remove the residue from the media.

24 Claims, 29 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 7

Full Titl	e Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RMC	Draw Desc   Ir
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12. Document ID: US 5804507 A

L6: Entry 12 of 17

File: USPT

Sep 8, 1998

US-PAT-NO: 5804507

DOCUMENT-IDENTIFIER: US 5804507 A

TITLE: Radially oscillating carousel processing system for chemical mechanical

polishing

DATE-ISSUED: September 8, 1998

INVENTOR - INFORMATION:

CITY STATE ZIP CODE COUNTRY NAME Perlov; Ilya Santa Clara CA Gantvarg; Eugene Santa Clara CA Lee; Harry Q. Mountain View CA Somekh; Sasson Los Altos Hills Tolles; Robert D. Santa Clara CA

US-CL-CURRENT: 438/692; 134/33, 156/345.12

#### ABSTRACT:

An apparatus for polishing semiconductor wafers and other workpieces that includes a polishing pads mounted on respective platens at multiple polishing stations. Multiple wafer heads, at least one greater in number than the number of polishing stations, can be loaded with individual wafers. The wafer heads are suspended from a carousel, which provides circumferential positioning of the heads relative to the polishing pads, and the wafer heads oscillate radially as supported by the carousel to sweep linearly across the respective pads in radial directions with respect to the rotatable carousel. Each polishing station includes a pad conditioner to recondition the polishing pad so that it retains a high polishing rate. Washing stations may be disposed between polishing stations and between the polishing stations and a transfer and washing station to wash the wafer as the carousel moves. A transfer and washing station is disposed similarly to the polishing pads. The carousel simultaneously positions one of the heads over the transfer and washing station while the remaining heads are located over polishing stations for wafer polishing so that loading and unloading of wafers and washing of wafers and wafer heads can be performed concurrently with wafer polishing. A robot positioned to the side of the polishing apparatus automatically moves cassettes filled with wafers into a holding tub, and transfers individual wafers vertically held in the cassettes between the holding tub and the transfer and washing station. The multiple polishing pads can be used to sequentially polish a wafer held in a wafer head in a step of multiple steps. The steps may be equivalent, may provide polishes of different finish, or may be directed to polishing different levels.

84 Claims, 117 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 74

Full Title Citation Front Review Classification Date Reference Sequences Attachments Claims MMC Drain	Deso Image

## 13. Document ID: US 5738574 A

L6: Entry 13 of 17

File: USPT

Apr 14, 1998

US-PAT-NO: 5738574

DOCUMENT-IDENTIFIER: US 5738574 A

TITLE: Continuous processing system for chemical mechanical polishing

DATE-ISSUED: April 14, 1998

## INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY Tolles; Robert D. Santa Clara CA Shendon; Norm San Carlos CA Somekh; Sasson Los Altos Hills CA Perlov; Ilya Santa Clara CA Gantvarg; Eugene Santa Clara CA Lee; Harry Q. Mountain View CA

US-CL-CURRENT: 451/288; 451/247, 451/285, 451/286, 451/287, 451/289, 451/332, 451/401,

451/41

#### ABSTRACT:

An apparatus for polishing semiconductor wafers and other workpieces that includes polishing pads mounted on respective platens at multiple polishing stations. Multiple wafer heads, at least one greater in number than the number of polishing stations, can be loaded with individual wafers. The wafer heads are suspended from a carousel, which provides circumferential positioning of the heads relative to the polishing pads, and the wafer heads oscillate radially as supported by the carousel to sweep linearly across the respective pads in radial directions with respect to the rotatable carousel. Each polishing station includes a pad conditioner to recondition the polishing pad so that it retains a high polishing rate. Washing stations may be disposed between polishing stations and between the polishing stations and a transfer and washing station to wash the wafer as the carousel moves. A transfer and washing station is disposed similarly to the polishing pads. The carousel simultaneously positions one of the heads over the transfer and washing station while the remaining heads are located over polishing stations for wafer polishing so that loading and unloading of wafers and washing of wafers and wafer heads can be performed concurrently with wafer polishing. A robot positioned to the side of the polishing apparatus automatically moves cassettes filled with wafers into a holding tub, and transfers individual wafers vertically held in the cassettes between the holding tub and the transfer and washing station. The multiple polishing pads can be used to sequentially polish a wafer held in a wafer head in a step of multiple steps. The steps may be equivalent, may provide polishes of different finish, or may be directed to polishing different levels.

41 Claims, 120 Drawing figures Exemplary Claim Number: 17 Number of Drawing Sheets: 74

Full Title Citation Front Review Classification Date Reference Sequences Attachments

10000 Draw Desc Image

14. Document ID: US 4813602 A

L6: Entry 14 of 17

File: USPT

Mar 21, 1989

US-PAT-NO: 4813602

DOCUMENT-IDENTIFIER: US 4813602 A

TITLE: Pulsating liquid cleaning device

DATE-ISSUED: March 21, 1989

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Corey; Paul Del Mar CA 92014

US-CL-CURRENT: <u>239/101</u>; <u>222/246</u>, <u>222/387</u>, <u>239/331</u>, <u>433/90</u>

#### ABSTRACT:

A <u>cleaning apparatus</u> for generating a pulsed liquid stream, comprising a fluid tight housing having a cylindrical side wall, and first and second ends being compact enough to be hand held by a user. A piston mounted in the housing forms a liquid tight seal with the sides of the housing and slides between a first and a second position in response to an actuation means operated by hand pressure. An output port in the second end of the housing is connected to a nozzle for directing liquid at a desirable location. A liquid control means connected between the output port and the nozzle receives pressurized liquid exiting through the output port and transfers discrete portions of the liquid to the nozzle forming a pulsative stream of liquid exiting the nozzle.

The liquid control means can comprise a rod connected to the piston and extending toward the output port with a plurality of cylindrical plugs secured thereto at intervals determined by a desired length or fluid quantity for pulses in said pulsative

stream, each plug having a length commensurate with desired periodicity for pulses in said pulsative stream, and a diameter as close to that of said output port as possible without preventing the movement through the output port.

In addition, a liquid tight, flexible or static bladder for confining predetermined portions of a desired cleaning solution can be employed within the apparatus housing.

7 Claims, 7 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments |

FWAC | Draw Desc | Image |

15. Document ID: US 4676261 A

L6: Entry 15 of 17

File: USPT

Jun 30, 1987

US-PAT-NO: 4676261

DOCUMENT-IDENTIFIER: US 4676261 A

TITLE: Hot tank spray washer and controls

DATE-ISSUED: June 30, 1987

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Blaul; Ronald L. Crystal Lake IL

US-CL-CURRENT: <u>134/57R</u>; <u>134/104.4</u>, <u>134/111</u>, <u>134/200</u>

## ABSTRACT:

Hot tank washer for cyclically repeated temporary intervals of spray cleaning operation, and controls therefor automatically coordinating operation of the system initiating switch, a heat interruption switch, and a door switch with one another and with other system operations. The heat interruption switch inherently puts the hot tank heating on standby momentarily with no power, incident to the user operating the spray system initiating switch; the spray system comes on under full power, incident to, and only contingent upon, the hot tank heating being first put on standby with no power; the spray system and a washer defogger system are automatically secured from operation, incident to the door switch being operated by opening of an access door allowing new work to be put into the washer.

23 Claims, 11 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 3

Full Title Citation Front Review Classification Date Reference Sequences Attachments

KMC Draw Desc Image

16. Document ID: US 4561903 A

L6: Entry 16 of 17 File: USPT Dec 31, 1985

US-PAT-NO: 4561903

DOCUMENT-IDENTIFIER: US 4561903 A

TITLE: Method of solvent spray cleaning in an enclosed chamber

DATE-ISSUED: December 31, 1985

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Blaul; Ronald L. Crystal Lake IL

US-CL-CURRENT: 134/10; 134/104.4, 134/111, 134/113, 134/18, 134/200, 454/56, 55/385.1

#### ABSTRACT:

High pressure washing method utilizing a hand directed <u>spray nozzle</u> for cleaning parts, by eye through a viewing window, and an enclosing chamber containing the parts in a manner whereby the zone for solvent <u>spray by the nozzle</u> is closely confined within the <u>enclosure</u> so as not to expose the operator or the outside environment to the liquid runoff of the solvent, or to the sprayed particles thereof, or to solvent steam or rising vapors. With a view to ecology considerations, and in addition to the concern to confine the contaminant from escaping into the environment, the internal air of the chamber and all solvent are continually recycled for re-use according to the washing procedure. Such procedure entails, in the practice of the instant invention, keeping down the vapor concentration by defogging the chamber air, and simultaneously defogging the viewing window through blanketing same by the defogged air as recycled.

13 Claims, 11 Drawing figures Exemplary Claim Number: 9 Number of Drawing Sheets: 3

Full Title Citation Front Review Classification Date Reference Sequences Attachments NMC Draw Desc Image

## 17. Document ID: US 4182001 A

L6: Entry 17 of 17

File: USPT

Jan 8, 1980

US-PAT-NO: 4182001

DOCUMENT-IDENTIFIER: US 4182001 A

TITLE: Surface cleaning and rinsing device

DATE-ISSUED: January 8, 1980

INVENTOR-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY

Krause; Helmuth W. Westport CT 06880

US-CL-CURRENT: 15/320; 15/385

## ABSTRACT:

A surface cleaning and rinsing device has a <u>rotor</u> rotatable in a housing with the underside of the <u>rotor</u> being provided with a plurality of suction nozzles and a plurality of orbitally rotating brushes positioned between said suction nozzles. Adjustable <u>spray nozzles</u> are also provided on the underside of the <u>rotor</u> for spraying a cleaning liquid onto the surface to be cleaned in advance of the brushes with respect to the direction of rotation of the <u>rotor</u>, or liquid supply means dispenses the liquid through the brushes themselves, with each of the suction nozzles serving to extract the liquid and loosened dirt immediately after brushing has occurred. The outer peripheries of the brushes are caused to rotate in the opposite direction from the <u>rotor</u> itself, and the brushes are turning at a rotational speed significantly faster than the <u>rotor</u>; therefore, they are able to lift up and flip over the pile of a rug being cleaned for also cleansing the underside of the pile. An advantageous cyclical scrubbing action on the pile is produced, in which the liquid-dwell-time is machine controlled, and very little over-all liquid is required per square yard of floor covering for achieving thorough cleaning and rinsing.

14 Claims, 13 Drawing figures Exemplary Claim Number: 1 Number of Drawing Sheets: 4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | KMC | Drain Desc | Image |

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